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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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COOLEY GODWARD LLP
777 6TH STREET NW
SUITE 1100
WASHINGTON, DC 20001

EXAMINER	
GOLDBERG, JEANINE ANNE	

ART UNIT	PAPER NUMBER
1634	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/694,541	FODOR ET AL.	
	Examiner	Art Unit	
	Jeanine A. Goldberg	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 May 2007; 11/8/07*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *26-30 and 32-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *26-30 and 32-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/07; 11/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the papers filed May 4, 2007. Currently, claims 26-30, 32-55 are pending. All arguments have been thoroughly reviewed but are deemed non-persuasive for the reasons which follow.

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 4, 2007 has been entered.

3. Any objections and rejections not reiterated below are hereby withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 26-29, 32-36, 38-39, 44, 46-51, 53-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drmanac et al. (Poster Presentation at the DOE/NIH Human Genome Contractor/Grantee Workshop, November 3, 1989) in view of Gingeras et al. (Nucleic Acids Research, Vol. 15, No. 13, pages 5373-5390, 1987) and Ghosh et al. (Nucleic Acids Research, Vol. 15, No. 13, pages 5353-5372, 1987).

Drmanac et al. (herein referred to as Drmanac) teaches a process for determination of a complete or a partial contents of very short sequences in the samples of nucleic acids connected to the discrete particles of microscopic size by hybridization with oligonucleotide probes. Drmanac teaches both directed and inverse SBH (sequencing by hybridization). Drmanac teaches 10,000,000,000 different discrete particles were prepared each carrying one of all possible 15 mer oligos. Drmanac teaches DP type association of a physical attribute of DPs like shape, size, color, for example would constitute the encoded nature of the bead. Drmanac teaches DNA chip

manufacture may occur by combinatorial synthesis and/or attachment of sequencing and marker oligos on microbeads. Drmanac teaches that the recognition of specific locations by successive hybridization with marker oligonucleotides (page 6). Drmanac illustrates two ways of associating hybridization data obtained from the location on the surface, including a physical attribute of DPs like shape, specific clone/probe (see page 15, Figure 1). With respect to Claims 36, 51, the sample used by Drmanac are biological samples. Biological samples are amplified in vivo during normal cell processes.

Drmanac does not specifically teach using nucleic acids between 25-100 nucleotides in length.

However, Ghosh teaches coupling of oligonucleotides 17-29 bases in length to solid supports derivitized with alkyl-amino and –carboxylic functionalities. Ghosh specifically teaches that DNA immobilized on supports can be used for biochemistry and molecular biology for the detection, isolation and genetic analysis of specific DNA sequences. Ghosh teaches that their choice of oligonucleotides in the 20-50 base length range has been influenced by a number of factors including the use of automated nucleic acid synthesizers. Ghosh teaches the sequences allow sample to be screened quickly for the presence of target sequences.

Similarly, Gingeras teaches hybridization properties of immobilized nucleic acids. Gingeras teaches use of sephacryl 500 dextran supports from Pharmacia for immobilizing oligonucleotides. Gingeras teaches immobilization of 29 and 30 mer oligonucleotides. Gingeras teaches the dextran supports provides a means of rapidly

and efficiently purifying long or short target sequences of interest. Gingeras further teaches that detection of low copy-number nucleic acid sequences is possible, the ability to separate and concentrate these rare target sequences from a pool of background and this purification is simple for use.

Therefore, it would have been prima facie obvious at the time the invention was made to have modified the teachings of Drmanac which uses probes of 4-20 bases with the teachings of Ghosh for using probes of 17-29 bases. Ghosh specifically teaches the 20-50 base nucleotides allows for screening of presence of target sequences. Thus, the ordinary artisan would have been motivated to have made longer sequences in the range of 20-50 bases to detect target sequences. Ghosh specifically examines the chemistry and attachments of nucleic acids to the glass beads and obtains covalent attachment which allows further analysis on the solid beads. Gingeras specifically teaches that the oligonucleotides allow detection of and purification of long or short target sequences which are rare from a pool of background nucleic acids.

5. Claims 30, 37, 40-43, 45, 52, 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drmanac et al. (Poster Presentation at the DOE/NIH Human Genome Contractor/Grantee Workshop, November 3, 1989) in view of Gingeras et al. (Nucleic Acids Research, Vol. 15, No. 13, pages 5373-5390, 1987) and Ghosh et al. (Nucleic Acids Research, Vol. 15, No. 13, pages 5353-5372, 1987) as applied to -29, 32-36, 38-39, 44, 46-51, 53-54 above and further in view of Malcom et al. (WO 86/03782, July 1986).

Neither Drmanac, Gingeras nor Ghosh specifically teach using the method for detection of causative mutations leading to medical conditions.

However, Malcom specifically teaches bead based methods for detecting hybridization. The hybridization between the first (immobilize) reagent and the second (labeled) reagent can be used to infinite excess (page 5). The method can be used to identify pathogenic micro-organisms in a sample, genetic abnormalities as well as simply a gene mapping exercise. In particular, Malcom teaches the identification of sickle cell disease which is caused by a single base mutation (page 6, lines 5-10). The single base mutation is detected by detecting perfect or imperfect matching between sample and probes. Malcom teaches labeling of nucleic acid for detection may occur by non-radioactive labels such as enzymatic, fluorescent and chemiluminescent labels (page 4).

Therefore, it would have been prima facie obvious at the time the invention was made to have modified the method of Drmanac in view of Gingeras and Ghosh for detecting markers on bead supports with the teachings of Malcom to detect genetic markers associated with disease conditions on bead supports. Malcom teaches the application to identification of particular diseases allows for speed and efficiency (see page 3 of Malcom) and is capable of providing a much improved sensitivity.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent

and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claims 26-35, 38 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 22, 7 of U.S. Patent No. 6,852,488

An obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but an examined application claim is not patentably distinct from the reference claim(s) because the examined claim is either anticipated by or would have been obvious over, the reference claim(s). See e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985).

Although the conflicting claims are not identical, they are not patentable distinct from each other because Claims 26-35, 38 of the instant application is generic to all that is recited in Claim 22 and 7 of U.S. Patent No. 6,852,488. That is, Claim 22 of 6,852,488 falls entirely within the scope of Claim 26-35, 38 or in other words, Claim 26-35, 38 is anticipated by Claim 22 of 6,852,488. Here, claim 22 of U.S. Patent No. 6,852,488 recites a method of detecting a mutation in a target nucleic acid sequence vs a known sequence by exposing a target sequence to at least one known core sequence

where the core sequence is attached to a beach; determining the binding affinity to the target sequence and comparing affinity (i.e. hybridization) to detect a mutation. Claim 7 of '488 is drawn to probes of between 5-100 bases in length (instant Claims 31-33).

Response to Arguments

The response traverses the rejection. The response asserts that the claims were amended after the double patenting rejections were made to clarify that the probes are between 25-100 nucleotides in length. This argument has been considered but is not convincing because Claim 7 states that the probe is between 5-100 bases in length; Claim 8 states 5-50 and Claim 9 states 8-30 bases in length. Thus, the instant claims requiring 25-100 are within the scope of the claims of '488. Thus for the reasons above and those already of record, the rejection is maintained.

7. Claims 26-55 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-53 of U.S. Patent No. 6,440,667 in view of Gingeras et al. (Nucleic Acids Research, Vol. 15, No. 13, pages 5373-5390, 1987) and Ghosh et al. (Nucleic Acids Research, Vol. 15, No. 13, pages 5353-5372, 1987).

An obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but an examined application claim is not patentably distinct from the reference claim(s) because the examined claim is either anticipated by or would have been obvious over, the reference claim(s). See e.g., *In re Berg*, 140 F.3d

1428, 46 USPQ2d 1226 (fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985).

Here, claim 39, for example, of U.S. Patent No. 6,440,667 recites a method of identifying a target nucleic acid in a sample by contacting a target sample with a collection of beads that bear different probe nucleic acids and a probe encoding system. Based on hybridization, the different probes on the beads identify the target nucleic acid. The method of Claim 39, for example differs from Claim 26 herein in that it fails to disclose probes of 25-100 nucleotides in length.

However, Ghosh teaches coupling of oligonucleotides 17-29 bases in length to solid supports derivitized with alkyl-amino and –carboxylic functionalities. Ghosh specifically teaches that DNA immobilized on supports can be used for biochemistry and molecular biology for the detection, isolation and genetic analysis of specific DNA sequences. Ghosh teaches that their choice of oligonucleotides in the 20-50 base length range has been influenced by a number of factors including the use of automated nucleic acid synthesizers. Ghosh teaches the sequences allow sample to be screened quickly for the presence of target sequences.

Similarly, Gingeras teaches hybridization properties of immobilized nucleic acids. Gingeras teaches use of sephacryl 500 dextran supports from Pharmacia for immobilizing oligonucleotides. Gingeras teaches immobilization of 29 and 30 mer oligonucleotides. Gingeras teaches the dextran supports provides a means of rapidly and efficiently purifying long or short target sequences of interest. Gingeras further teaches that detection of low copy-number nucleic acid sequences is possible, the

ability to separate and concentrate these rare target sequences from a pool of background and this purification is simple for use.

Therefore, it would have been obvious to modify the method of Claim 1-53 of U.S. Patent No. 6,440,667 such that the probes were 25-100 nucleotides in length as taught by Ghosh and Gingeras. Ghosh specifically teaches the 20-50 base nucleotides allows for screening of presence of target sequences. Thus, the ordinary artisan would have been motivated to have made longer sequences in the range of 20-50 bases to detect target sequences. Ghosh specifically examines the chemistry and attachments of nucleic acids to the glass beads and obtains covalent attachment which allows further analysis on the solid beads. Gingeras specifically teaches that the oligonucleotides allow detection of and purification of long or short target sequences which are rare from a pool of background nucleic aicds.

8. Claims 26-55 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-25 of U.S. Patent No. 6,544,739 in view of Gingeras et al. (Nucleic Acids Research, Vol. 15, No. 13, pages 5373-5390, 1987) and Ghosh et al. (Nucleic Acids Research, Vol. 15, No. 13, pages 5353-5372, 1987).

An obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but an examined application claim is not patentably distinct from the reference claim(s) because the examined claim is either anticipated by or would have been obvious over, the reference claim(s). See e.g., *In re Berg*, 140 F.3d

1428, 46 USPQ2d 1226 (fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985).

Here, claim 23, for example, of U.S. Patent No. 6,544,739 recites a method of identifying different biological entities by providing a plurality of markers which comprise a different and unique nucleic acid, combining the sample with a unique and determinable nucleic acid sequence and identifying the sequence. Beads comprising a plurality of nucleic acid probes attached thereto are provided under hybridization conditions. The method of Claim 23, for example differs from Claim 26 herein in that it fails to disclose probes of 25-100 nucleotides in length.

However, Ghosh teaches coupling of oligonucleotides 17-29 bases in length to solid supports derivitized with alkyl-amino and –carboxylic functionalities. Ghosh specifically teaches that DNA immobilized on supports can be used for biochemistry and molecular biology for the detection, isolation and genetic analysis of specific DNA sequences. Ghosh teaches that their choice of oligonucleotides in the 20-50 base length range has been influenced by a number of factors including the use of automated nucleic acid synthesizers. Ghosh teaches the sequences allow sample to be screened quickly for the presence of target sequences.

Similarly, Gingeras teaches hybridization properties of immobilized nucleic acids. Gingeras teaches use of sephacryl 500 dextran supports from Pharmacia for immobilizing oligonucleotides. Gingeras teaches immobilization of 29 and 30 mer oligonucleotides. Gingeras teaches the dextran supports provides a means of rapidly and efficiently purifying long or short target sequences of interest. Gingeras further

teaches that detection of low copy-number nucleic acid sequences is possible, the ability to separate and concentrate these rare target sequences from a pool of background and this purification is simple for use.

Therefore, it would have been obvious to modify the method of Claim 1-53 of U.S. Patent No. 6,440,667 such that the probes were 25-100 nucleotides in length as taught by Ghosh and Gingeras. Ghosh specifically teaches the 20-50 base nucleotides allows for screening of presence of target sequences. Thus, the ordinary artisan would have been motivated to have made longer sequences in the range of 20-50 bases to detect target sequences. Ghosh specifically examines the chemistry and attachments of nucleic acids to the glass beads and obtains covalent attachment which allows further analysis on the solid beads. Gingeras specifically teaches that the oligonucleotides allow detection of and purification of long or short target sequences which are rare from a pool of background nucleic acids.

9. Claims 26-30, 32-55 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 1, 3, 22-25 of copending Application No. 11/036,317, 11/175,859 in view of Drmanac et al. (Poster Presentation at the DOE/NIH Human Genome Contractor/Grantee Workshop, November 3, 1989)

Although the conflicting claims are not identical, they are not patentably distinct from each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

An obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but an examined application claim is not patentably distinct from the reference claim(s) because the examined claim is either anticipated by or would have been obvious over, the reference claim(s). See e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985).

Although the conflicting claims are not identical, they are not patentable distinct from each other because Claims 26-30, 32-55 of the instant application is generic to all that is recited in Claims 22-26 of copending Application No. 11/036,317. That is, Claims 22-26 of copending Application No. 11/036,317falls within the scope of Claims 26-30, 32-55 , or in other words, Claims 26-30, 32-55 are anticipated by Claims 22-26 of copending Application No. 11/036,317. Here, Claims 22 of copending Application No. 11/036,317recites

22. A method of detecting a plurality of mature RNA isoforms from each of a plurality of mouse genes in a biological sample from a mouse comprising: obtaining a nucleic acid derived from the biological sample; labeling the nucleic acid; hybridizing the labeled nucleic acid to the array of claim 1;
detecting the hybridization pattern; and
analyzing the hybridization pattern to detect a plurality of mature RNA isoforms from at least two mouse multi exon genes.
23. The method of claim 22 wherein the labeled nucleic acid hybridized to the array consists essentially of DNA.
24. The method of claim 22 wherein the labeled nucleic acid hybridized to the array consists essentially of RNA that is complementary to the target mRNA.

25. The method of claim 22 wherein the labeled nucleic acid hybridized to the array consists essentially of RNA that is in the sense orientation relative to the target mRNA.

3. (Original) The array of claim 1 wherein the array comprises a plurality of beads wherein the probes are attached to the beads and the probes on a bead consist essentially of one of the sequences listed in SEQ ID Nos. 1-991,174.

It is noted that SEQ ID NO: 1-991,174 are 25 mer nucleic acids.

US 11/036,317 does not specifically teach using an encoding system for identifying different beads.

However, Drmanac et al. (herein referred to as Drmanac) teaches a process for determination of a complete or a partial contents of very short sequences in the samples of nucleic acids connected to the discrete particles of microscopic size by hybridization with oligonucleotide probes. Drmanac teaches both directed and inverse SBH (sequencing by hybridization). Drmanac teaches 10,000,000,000 different discrete particles were prepared each carrying one of all possible 15 mer oligos. Drmanac teaches DP type association of a physical attribute of DPs like shape, size, color, for example would constitute the encoded nature of the bead.

Therefore, it would have been prima facie obvious at the time the invention was made to have encoded the beads of US 11/036,317 to enable the detection and identification of particular beads and thereby identification of the target sequences.

10. Claims 26-30, 32-55 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 13-14 of copending Application No. 11/175,859 in view of Drmanac et al. (Poster Presentation at the DOE/NIH Human Genome Contractor/Grantee Workshop, November 3, 1989)

Although the conflicting claims are not identical, they are not patentably distinct from each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

An obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but an examined application claim is not patentably distinct from the reference claim(s) because the examined claim is either anticipated by or would have been obvious over, the reference claim(s). See e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985).

Although the conflicting claims are not identical, they are not patentable distinct from each other because Claims 26-30, 32-55 of the instant application is generic to all that is recited in Claims 13-14 of copending Application No. 11/175,859. That is, Claims 13-14 of copending Application No. 11/175,859 falls within the scope of Claims 26-30, 32-55 , or in other words, Claims 26-30, 32-55 are anticipated by Claims 13-14 of copending Application No. 11/175,859. Here, Claims 13-14 of copending Application No. 11/175,859 recites

13. A method of genotyping at least 5,000 singlenucleotide polymorphisms in parallel comprising: obtaining a nucleic acid sample; amplifying fragments of DNA in the nucleic acid sample; hybridizing the amplified sample to a genotyping array, wherein the genotyping array comprises at least 10,000 a plurality of different allele specific perfect match probes each attached to a solid support;
wherein each allele specific perfect match probe comprises at least consists of 20 to 50 contiguous nucleotides from a different sequence listed in SEQ ID Nos. 1-116,211 and wherein the plurality of different allele specific perfect match probes consists of at least one probe consisting of at between 20 and 50 contiguous nucleotides from each of SEQ ID NOs. 1- 116,211; wherein each of the allele specific perfect match probes includes the polymorphic position of the sequence and each probe is perfectly complementary to one of the two possible alleles; and wherein each different allele specific perfect match probes is attached to a solid support in a known or determinable location of the array;
analyzing the resulting hybridization pattern; and
determining the genotype of the sample for each of the at least 1,000 single nucleotide polymorphisms.
14. The method of claim 13 wherein the solid support is a plurality of beads wherein each allele specific perfect match probe is attached to a different bead.

It is noted that SEQ ID NO: 1-116,211 are 25 mer nucleic acids.

US 11/175, 859 does not specifically teach using an encoding system for identifying different beads.

However, Drmanac et al. (herein referred to as Drmanac) teaches a process for determination of a complete or a partial contents of very short sequences in the samples of nucleic acids connected to the discrete particles of microscopic size by hybridization with oligonucleotide probes. Drmanac teaches both directed and inverse SBH (sequencing by hybridization). Drmanac teaches 10,000,000,000 different discrete particles were prepared each carrying one of all possible 15 mer oligos. Drmanac

teaches DP type association of a physical attribute of DPs like shape, size, color, for example would constitute the encoded nature of the bead.

Therefore, it would have been prima facie obvious at the time the invention was made to have encoded the beads of US 11/175, 859 to enable the detection and identification of particular beads and thereby identification of the target sequences.

Conclusion

11. No claims allowable.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A) Monahan et al. (EP 0 154 505) teaches diagnosis of gene abnormalities by restriction mapping using a sandwich hybridization format. The method of Monahan does not specifically teach a plurality of different target sequences. The method appears to teach analysis of a single polymorphism.

B) Malcolm et al. (WO 86/03782, July 1986) teaches sandwich hybridization for detection of nucleotide sequence.

C) Dattagupta et al. (EP 0 130 515 A2, January 9, 1985) teaches testing DNA samples for particular nucleotide sequences.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Jeanine Goldberg whose telephone number is (571) 272-0743. The examiner can normally be reached Monday-Friday from 7:00 a.m. to 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla, can be reached on (571) 272-0735.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

The Central Fax Number for official correspondence is (571) 273-8300.

J. Goldberg

Jeanine Goldberg
Primary Examiner
January 17, 2008